PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements in Catalytic Heating Apparatus.

We, SOCIÉTÉ LYONNAISE DES RÉCHAUDS CATALYTIQUES (SOCIÉTÉ ANONYME), a company organized under the laws of France, of 2bis, Route des Soldats, Caluire (Rhone), France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Catalytic heating apparatus hitherto used comprise one or more cylindrical wicks having such diameter that the intensity of vaporization is not greater than the catalysation power of the catalysing fabric. In the known apparatus after a certain amount of use the upper part of the wick, inbued with the residual gums from the spirit fuel and carbonized by the heat becomes hardened and no longer serves for the capillary conduction of the fuel into proximity with the fabric. This gives rise to difficulties in starting the apparatus and to a considerable reduction of its heat intensity, due to insufficient vaporization which often produces an unpleasant odour, certain portions of the cloth being not maintained at the temperature at which catalysation is produced.

Also the wick owing to a certain shrinkage of the cotton due to the successive operations of moistening with the fuel is not sufficiently fed owing to want of contact with the surrounding cotton.

The present invention relates to means for preventing these drawbacks.

For this purpose one wick only is used in the form of a hollow cylinder of large diameter and mounted on a wick tube of wide meshed metal gauze. This tube is provided at the top with a lid of which the rim forms a screen so as to protect the upper edge of the wick from too intense heat. This lid is fitted on a wick-holder tube the wall of which is provided with slots. The catalytic fabric is the seat of a chemical exothermic reaction. The greater part of the heat produced is radiated to the exterior by the upper face of the fabric. Another part of the heat is radiated to the interior of the apparatus. The heat radiated by the lower surface of the catalytic fabric acts on a large surface of wick formed by the inner surface of the latter. The vaporization operates over the whole of this surface which is safeguarded from the risk of gradual carbonization owing to its distance from the catalysing fabric.

Further the wick is composed of two parts widely overlapping. The upper part which, after long use, is imbued with the refuse gums from the fuel, is removable; it is secured on the metal gauze tube by means of press fasteners. The lower part is sewn on this tube and extends downwards and at its lower end is cut along several generatrix; the free flaps thus formed are turned inwards so as to form a flat base to the wick on which a spiral spring arranged inside the metal tube presses, in order to keep said base pressed on a sheet of swanskin placed at the bottom of the fuel tank and on a layer of carded twist. Thus a close contact is obtained between the wick and the swanskin sheet, which owing to the capillary action, is constantly fed by the upper layers of cotton twist.

The accompanying drawing illustrates an example of construction of the invention:

Fig. 1 is an axial section of a complete apparatus for heating by catalysis.

Fig. 2 is a view in sectional-elevation of the different members constituting the wick.

The cylindrical and hollow wick is formed of two portions, one *a* which is removable and the other *c* which is fixed, both are secured round a metal gauze tube *d*, the former by means of press

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fasteners *b* and the latter being sewn on said tube. An enlargement *e* of the metal gauze tube *d* indicates the position to be occupied by the removable wick portion *a* which is protected from the excessive heat of the catalytic fabric *f* by the lid *g* secured to the upper portion of the tube *d* and fitting on to the fixed wick-holder tube *h* provided with slots h^1. The part *w* is a simple cross-bar intended to impart rigidity to the central portion of the catalytic fabric or disc *f*. The catalytic fabric or disc *f* is quite independent of the cover *g* which rests on the tube *h*. The disc *f* is carried by the crown *u* which supports it adjacent its periphery; it is not supported at its centre.

The cover *g* fits with slight friction on the tube *h* and to prevent these parts separating from one another they are connected by means of a pin (not shown) which diametrically traverses the cover *g* the wick holder tube *h* and the tube *d*.

The fixed wick portion *c*, longer than the tube *d*, is cut from the lower edge of the latter along a number of lines. The flaps *i*, *j*, *k*, *l* thus formed are turned over inwards so as to form several thicknesses under the wick. The base of the wick thus formed is kept pressed against the swanskin sheet *m* by a spiral spring *n* confined between this base and an interior flange *o* of the tube *d*.

It is to be noted that since the tube *h* is fixed and the tube *d* and cover *g* are fixed thereto by the pin the spring *n* does not act to apply the cover *g* against the catalytic fabric or disc *f*.

The sheet *m*, of the same diameter as the interior diameter of the fuel tank *p* rests on a layer of carded cotton *q*. Above are arranged layers of carded cotton *r*, filling the whole tank and provided with a central hole for the passage of the wick. A filling orifice *s* provided with a perforated tube *t* serves for the introduction of the liquid fuel. The wick passing through the mass of cotton, through the passage reserved for it, is fitted by its lid *g* on the wick-holder tube *h*; it is held in this position by the pin previously referred to. The spiral spring *n* is thus compressed and establishes pressure between the flat bottom of the wick and the sheets *m* to which the upper layers of cotton *r*, by capillary action and by action of gravity, continually feed the liquid fuel with which they are impregnated. The constant feeding of the wick is therefore assured.

In order to prevent cooling of the circumferential portion of the catalytic fabric *f* a metal hoop *u* is soldered and rivetted inside the vaporizing cone *y*, on the rim of this hoop the catalytic fabric presses. Thus an annular chamber is formed outside the hoop into which the vapours do not penetrate.

To distribute as equally as possible the gases arising from the cylindrical wick over the whole surface of the catalytic fabric *f*, the latter is given a thickness decreasing from the centre to the periphery or more exactly the compression of the material decreases from the centre to the periphery.

No pressure is exerted by the spring *n* on the fabric *f*. This spring serves solely to assure the pressure of the base of the wick *i j k l* on the washer *m*.

The platinated amianthus which constitutes the catalytic fabric *f* is when it is inserted between the gauze sheets f^1 heaped up more at the centre than at the periphery so that when these sheets are pressed together the compression of the catalytic fabric decreases from the centre to the periphery and the gases produced by the wick under the central part of the fabric, meet in this part a greater resistance to their passage and are thus distributed more equally over all the surface of the catalytic fabric to traverse the latter.

A small tube *v* is arranged having its orifice at the upper part of the gas chamber and permitting the introduction of a small quantity of fuel. A washer *x* of thick amianthus cardboard surrounds the perforated tube *h* and receives this fuel which impregnates it, the surplus passing through the orifices, perforations or slots h^1 of the tube *h* and moistens the wick at its upper part. This introduction of spirit immediately before the operations of starting the device working has the double purpose of accelerating the priming by introducing adjacent the fabric *f* a small quantity of fuel ready for vapourization and of preventing any part of the wick not sufficiently moistened with fuel being subjected to the action of the heat which would carbonize it.

The apparatus is set in action by heating the upper surface of the catalytic fabric by means of a separate source of heat. At the start no petrol vapour is produced.

The vapour only mixes with the air at the exterior surface of the catalytic fabric; the air does not enter the apparatus.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In a catalytic heating apparatus a

hollow cylindrical wick mounted on a wire gauze tube remote from and protected by a screen from the catalytic fabric, the said wick comprising two parts one removable and the other sewn on said tube and fed with fuel principally at its base which is pressed by a spring against a swanskin sheet arranged on a layer of cotton at the bottom of the fuel reservoir of the device.

2. An apparatus as in Claim 1 wherein the thickness or compression of the catalytic fabric decreases from the centre to the periphery in order to render as uniform as possible the density of the path of the vapours over all its surface.

3. An apparatus as in Claim 1 wherein a supplementary inlet for fuel is arranged so as to allow of the introduction adjacent the catalytic fabric of a reserve of fuel which when starting the apparatus moistens the upper part of the wick and also operates to preserve the latter by preventing carbonization thereof substantially as described.

4. In an apparatus as in Claim 1 the arrangement of a collar forming an annular chamber in a conical vaporization chamber of the apparatus supporting the catalytic fabric and preventing the cooling of the peripheral portion of said fabric by preventing access thereto of the distillation gases.

5. A catalytic heating apparatus substantially as herein described and as illustrated in the annexed drawings.

Dated this 3rd day of June, 1926.

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[This Drawing is a reproduction of the Original on a reduced scale.]

FIG.1

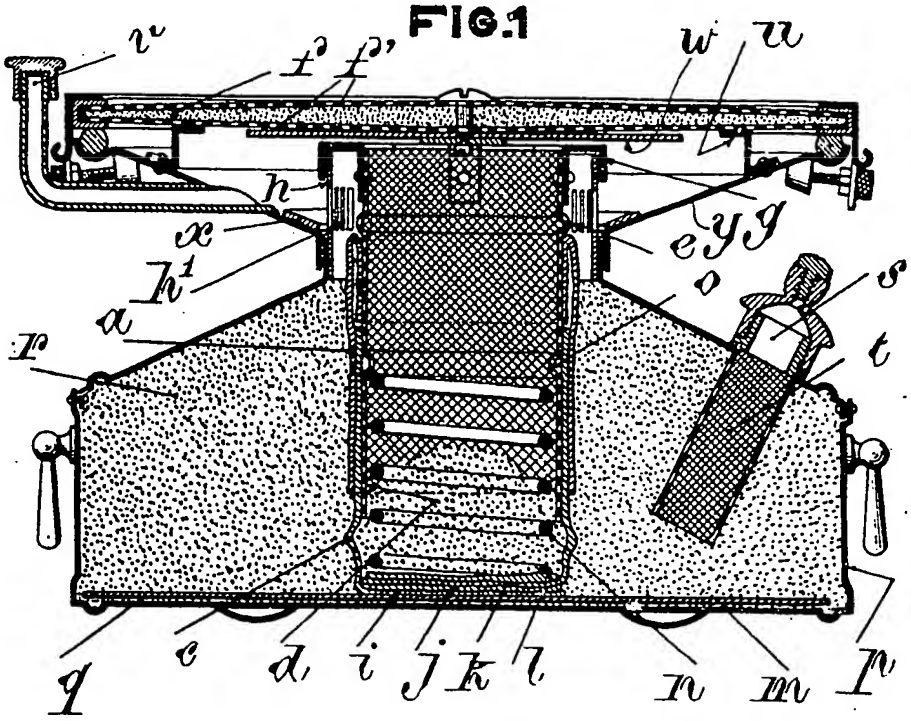
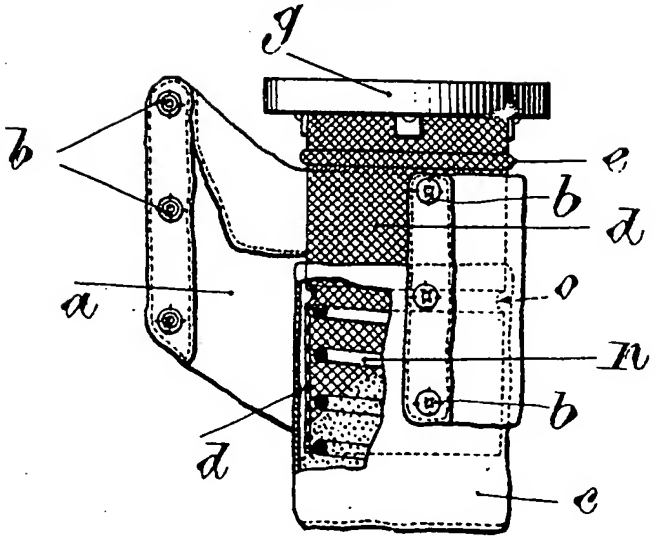


FIG.2



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